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INFLUENCE OF AGE ON THE VALUE OF DAIRY COWS AND FARM WORK HORSES.

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Research work in farm economics includes among other things questions relating to the value of farm animals, farm equipment, and agricultural products. Those who have occasion to buy or sell live stock are constantly confronted with the problem of weighing the many factors influencing the value of farm animals. Of these factors, the age of the animal is one that applies directly to the value of dairy cattle and farm work horses. While age is not the only factor affecting the value of these classes of animals, it is one of the most important. In determining the value of farm animals grown for meat only, which are ordinarily disposed of at an early age, this factor is comparatively unimportant.

By means of personal visits and through correspondence with many of our best informed farmers and live-stock breeders, the Office of Farm Management recently attempted to get reliable information concerning the influence of age on the values of dairy cows and farm work horses. Farm Management investigators have found that for farm data the average of a large number of estimates is almost as accurate as that of carefully kept records, provided the estimates are given by men who thoroughly know the subject under consideration. In this case all estimates were given by men each of whom has had wide experience with the class of live stock on which he furnishes information.

Note.—This bulletin is of interest to stock-raisers generally.

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The fact that the average of the estimates for each class remained practically constant after the first thirty replies had been averaged is some evidence as to the accuracy of the figures. The estimates secured by correspondence agree very closely with those secured through personal visits. While figures concerning the values of dairy cows and farm work horses were obtained from nearly every important agricultural district in the United States, most of the estimates were secured from New York, Pennsylvania, and the North Central States. In this work appreciation and depreciation were based on age only. In order to eliminate everything except age, the animal was assumed to be in perfect health and to have a fixed value at a certain age.

Four breeds of dairy cattle, Holstein, Guernsey, Jersey, and Ayrshire, were included in these investigations. No attempt was made to find the actual average value of animals belonging to any breed. Arbitrary values were assumed for a certain fixed age, merely to get a starting point from which to work. Thus for each breed estimates were based on four classes of 3-year-olds, namely, the $80 grade cow, the $100 grade, the $200 purebred, and the $300 purebred. If the cow was assumed to be with calf at 3 years of age, she was considered to have reached the same stage of pregnancy each succeeding year. In the case of purebred stock changes in the advanced registry of the cow herself, or of other animals related to her, were not considered in estimating values.

The farm work horse was assumed to have a maximum value of $250 when in his prime, which is a fair price for very good farm horses. Brood mares were excluded, as their value is not necessarily the same as that of animals kept for work only.

In so far as age affects values the tables presented in the bulletin should be helpful in buying and selling dairy cows and farm work horses, and in taking inventories. No attempt has been made to compare breeds. In fact, it is believed that none of the figures can be interpreted in such a way as to favor any particular breed.

INFLUENCE OF AGE ON VALUE OF COWS.

HOLSTEIN.

Table I shows the influence of age on the value of four classes of Holstein cows worth per head $80, $100, $200, and $300, respectively, at 3 years of age. (See fig. 1.) For each class the estimates are tabulated separately for the North Central States, the Northeastern States, and the United States, all sections. According to these estimates Holstein cows of all classes reach their maximum money value at 6 years of age. The values do not vary

greatly between the ages of 4 and 8 years. After that age depreciation is rapid. The estimated values given old cows may seem a little high, but it must be remembered that only animals in health were considered. Calves and old cows are valued relatively higher in the Central States than in the East. This is doubtless due

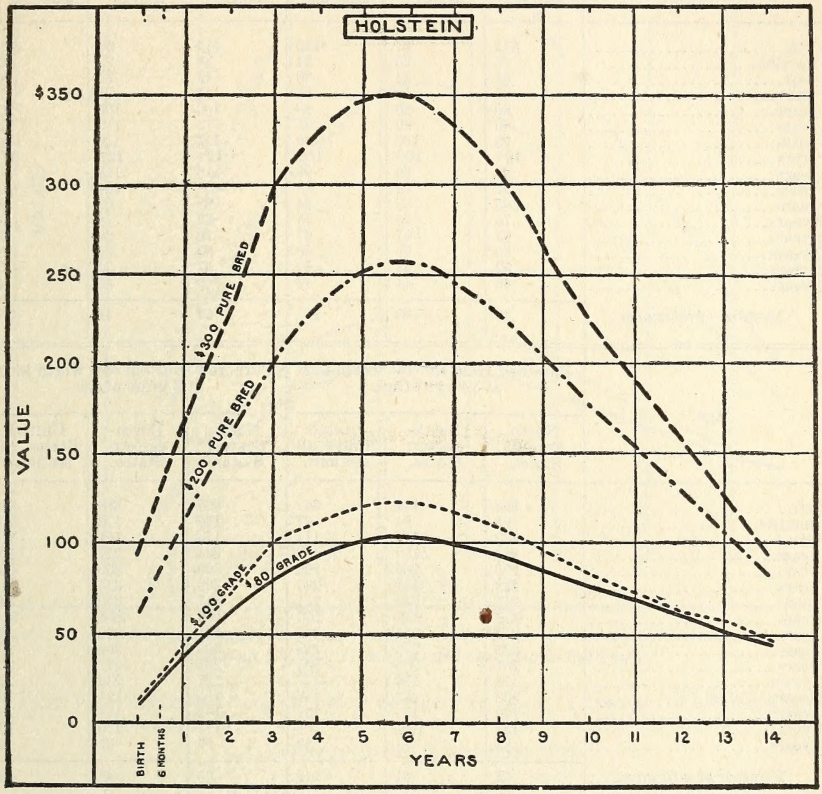

FIG. 1.—Curves showing influence of age on values of Holstein cows. (Averages of 528 estimates by owners, based on arbitrary values assumed for a certain fixed age.)

largely to the lower price of feed in the North Central States. During their years of highest production, the price of Holstein cows appears to average a little higher in the Eastern States. This difference, however, is not marked, and in the case of the $100 grade cow it is reversed.

TABLE I.—*Influence of age on values of Holstein cows. (Averages of 528 estimates by owners, based on arbitrary values assumed for a certain fixed age.)*

[Averages are reported to the nearest dollar.]

Age.	Grade Holstein cow worth $80 at 3 years of age.			Grade Holstein cow worth $100 at 3 years of age.		
	North Central States.[1]	North-eastern States.[2]	United States, all sections.	North Central States.	North-eastern States.	United States, all sections.
Birth	$12	$7	$10	$13	$9	$11
6 months	28	20	24	30	22	26
1 year	43	34	39	49	39	44
2 years	63	58	61	75	71	72
3 years	80	80	80	100	100	100
4 years	90	90	91	113	110	112
5 years	98	100	100	121	120	120
6 years	**101**	**102**	**102**	**121**	**122**	**122**
7 years	98	99	99	116	115	116
8 years	92	93	93	109	104	107
9 years	82	85	84	98	92	95
10 years	74	76	75	87	78	83
11 years	67	67	67	75	69	72
12 years	60	59	60	65	60	62
13 years	52	51	52	57	52	57
14 years	46	44	44	49	46	48
Number of estimates	49	48	107	57	41	159

Age.	Purebred Holstein cow worth $200 at 3 years of age.			Purebred Holstein cow worth $300 at 3 years of age.		
	North Central States.	North-eastern States.	United States, all sections.	North Central States.	North-eastern States.	United States, all sections.
Birth	$64	$59	$62	$95	$88	$92
6 months	91	84	87	132	122	128
1 year	122	113	117	173	161	168
2 years	160	159	160	234	227	231
3 years	200	200	200	300	300	300
4 years	228	231	233	328	334	331
5 years	245	249	251	347	352	348
6 years	**252**	**257**	**256**	**348**	**354**	**350**
7 years	242	245	245	331	340	332
8 years	226	229	229	305	309	304
9 years	201	205	205	265	272	265
10 years	174	179	177	227	233	226
11 years	152	153	152	196	191	192
12 years	128	126	127	162	158	159
13 years	104	101	104	127	120	124
14 years	84	73	82	97	91	94
Number of estimates	55	44	114	98	43	148

[1] North Central States: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, North Dakota, South Dakota, Iowa, Nebraska, Kansas, and Missouri.
[2] Northeastern States: New England States, New York, New Jersey, and Pennsylvania.

GUERNSEYS.

Table II shows the influence of age on the values of four classes of Guernsey cows, worth per head $80, $100, $200, and $300, respectively, at three years of age. The estimates are classified as in Table I. These figures, as compared with those in Table I, indicate that appreciation and depreciation due to age are about the same for Guernseys and Holsteins. According to these estimates, Guernsey calves and old cows, like those of the Holsteins, are cheaper in the East than in the Central West. In the case of pure breds in their prime, however, the reverse is true. The estimates indicate that Guernsey cows of all classes reach their highest value at 5 and 6 years of age. (See fig. 2.)

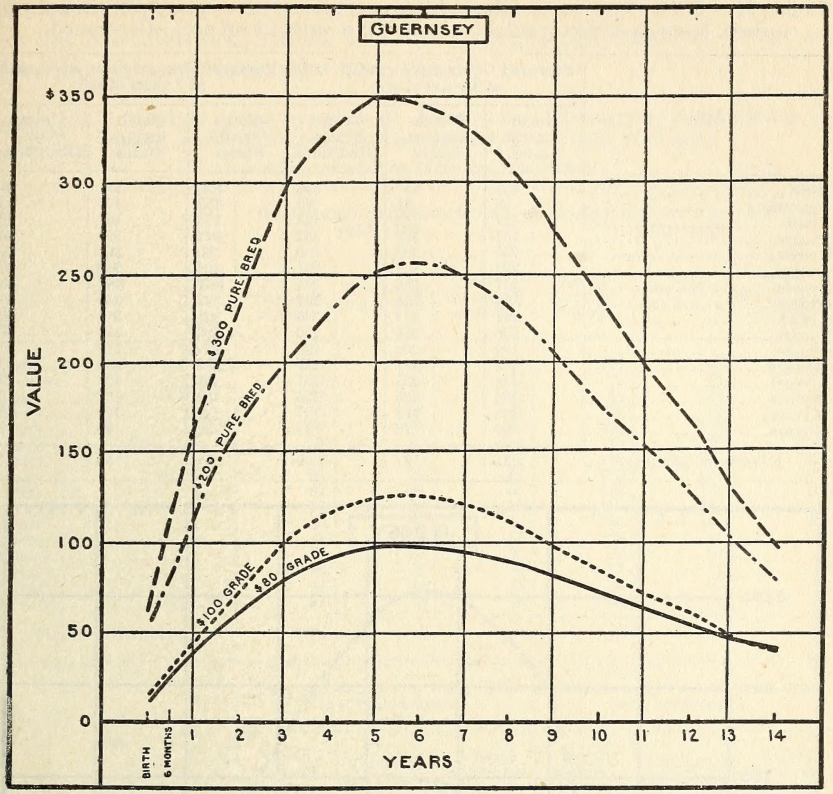

FIG. 2.—Curves showing influence of age on values of Guernsey cows. (Averages of 389 estimates by owners, based on arbitrary values assumed for a certain fixed age.)

TABLE II.—*Influence of age on values of Guernsey cows. (Averages of 389 estimates by owners, based on arbitrary values assumed for a certain fixed age.)*

[Averages as reported to the nearest dollar.]

Age.	Grade Guernsey cow worth $80 at 3 years of age.			Grade Guernsey cow worth $100 at 3 years of age.		
	North Central States.	North-eastern States.	United States, all sections.	North Central States.	North-eastern States.	United States, all sections.
Birth	$11	$10	$11	$15	$11	$13
6 months	25	21	24	30	25	27
1 year	40	38	40	48	42	45
2 years	61	58	61	74	70	72
3 years	80	80	80	100	100	100
4 years	92	90	91	116	118	117
5 years	99	**98**	**99**	127	126	126
6 years	**100**	**98**	**99**	**128**	**128**	**127**
7 years	97	96	96	123	121	121
8 years	91	91	90	115	112	111
9 years	83	81	82	100	97	97
10 years	73	72	73	87	84	85
11 years	65	63	64	74	69	71
12 years	57	53	55	63	59	61
13 years	50	46	48	52	47	49
14 years	44	39	42	42	40	41
Number of estimates	57	39	101	45	52	103

TABLE II.—*Influence of age on values of Guernsey cows. (Averages of 389 estimates by owners, based on arbitrary values assumed for a certain fixed age)*—Continued.

Age.	Purebred Guernsey cow worth $200 at 3 years of age.			Purebred Guernsey cow worth $300 at 3 years of age.		
	North Central States.	North-eastern States.	United States, all sections.	North Central States.	North-eastern States.	United States, all sections.
Birth	$57	$55	$56	$90	$71	$82
6 months	88	81	85	130	107	120
1 year	117	112	115	173	157	167
2 years	164	160	162	242	224	234
3 years	200	200	200	300	300	300
4 years	229	232	231	324	340	332
5 years	247	258	251	**337**	**363**	**350**
6 years	**250**	**264**	**257**	333	360	346
7 years	241	254	246	321	343	332
8 years	226	235	230	299	316	307
9 years	199	209	203	269	279	273
10 years	175	182	179	232	239	235
11 years	148	155	151	201	198	199
12 years	126	125	126	169	162	166
13 years	106	98	101	137	122	130
14 years	87	70	78	107	90	99
Number of estimates	31	34	70	57	50	115

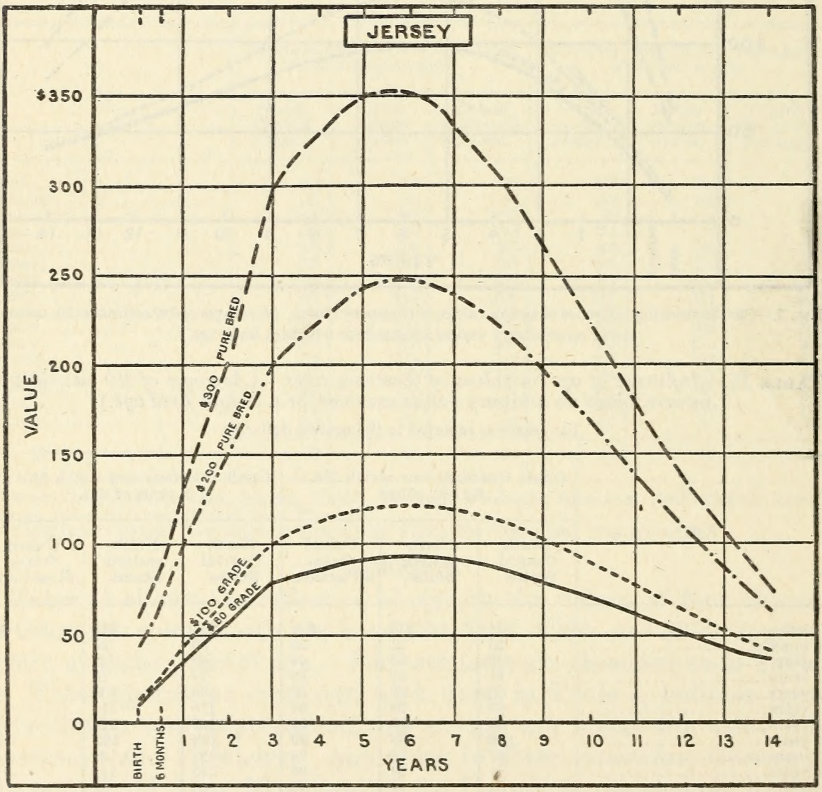

FIG. 3.—Curves showing influence of age on values of Jersey cows. (Averages of 511 estimates by owners, based on arbitrary values assumed for a certain fixed age.)

JERSEYS.

In Table III the estimates indicate that all classes of Jerseys are valued highest at 6 years, though the difference in value for 5 and 6

years is not great. Here, again, calves are rated relatively cheaper for the Northeastern States, but the regional difference in value as given for old cows is small. (See fig. 3.)

TABLE III.—*Influence of age on values of Jersey cows. (Averages of 511 estimates by owners, based on arbitrary values assumed for a certain fixed age.)*

[Averages are reported to the nearest dollar.]

Age.	Grade Jersey cow worth $80 at 3 years of age.			Grade Jersey cow worth $100 at 3 years of age.		
	North Central States.	Northeastern States.	United States, all sections.	North Central States.	Northeastern States.	United States, all sections.
Birth	$11	$8	$10	$13	$9	$12
6 months	23	19	22	26	24	26
1 year	37	32	35	44	42	44
2 years	59	56	57	72	69	72
3 years	80	80	80	100	100	100
4 years	86	87	86	110	116	111
5 years	91	93	91	119	124	119
6 years	**92**	**95**	**92**	**122**	**127**	**121**
7 years	92	93	91	121	126	119
8 years	86	88	86	116	120	113
9 years	80	82	79	105	109	102
10 years	71	74	71	92	96	89
11 years	62	62	61	79	84	77
12 years	54	52	52	66	71	64
13 years	44	42	43	54	57	52
14 years	37	34	36	43	46	41
Number of estimates	72	24	144	69	25	134

Age.	Purebred Jersey cow worth $200 at 3 years of age.			Purebred Jersey cow worth $300 at 3 years of age.		
	North Central States.	Northeastern States.	United States, all sections.	North Central States.	Northeastern States.	United States, all sections.
Birth	$42	$41	$44	$54	$50	$59
6 months	68	61	68	86	80	89
1 year	103	94	103	129	124	133
2 years	149	147	152	207	205	207
3 years	200	200	200	300	300	300
4 years	228	231	226	337	322	330
5 years	247	256	245	359	353	350
6 years	**254**	**269**	**249**	**364**	**355**	**351**
7 years	245	261	240	346	336	332
8 years	228	247	223	317	312	305
9 years	204	217	196	275	267	266
10 years	179	187	169	229	225	222
11 years	144	151	138	190	183	178
12 years	118	124	112	151	152	140
13 years	89	94	87	106	112	105
14 years	70	67	64	71	81	74
Number of estimates	52	34	137	31	16	96

AYRSHIRES.

According to the estimates averaged in Table IV, Ayrshire calves and old cows are cheaper in the Northeastern States than in the North Central States, while Ayrshire cows during their period of highest production are a little higher in the East. The values placed on old cows are exceptionally high for the North Central States. According to the estimates all classes of Ayrshires reach their maximum value at 6 years. (See fig. 4.)

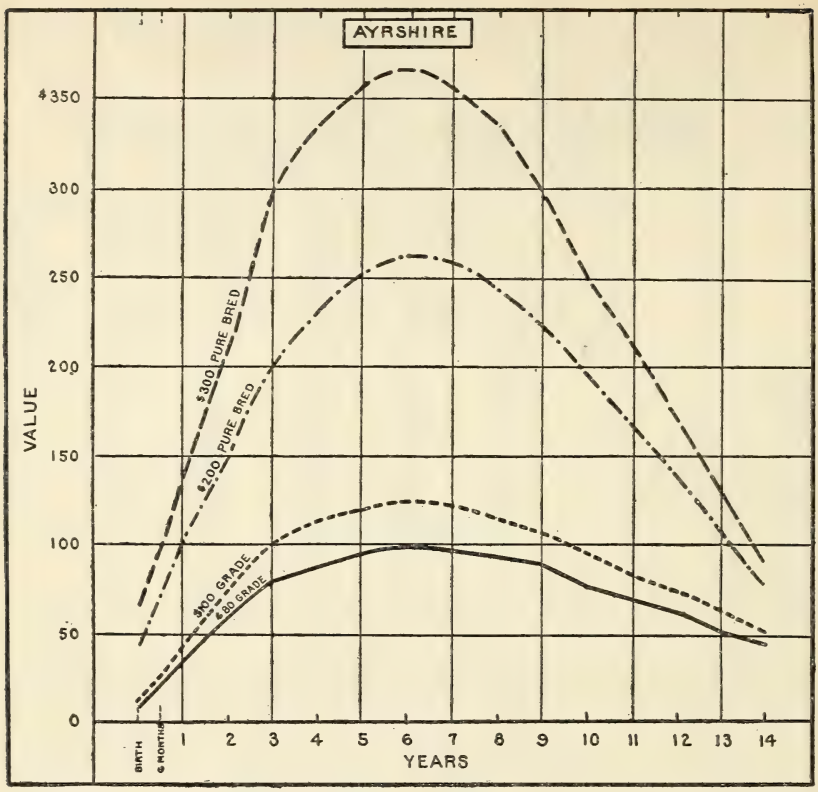

FIG. 4.—Curves showing influence of age on values of Ayrshire cows (Averages of 416 estimates by owners, based on arbitrary values assumed for a certain fixed age.)

TABLE IV.—*Influence of age on values of Ayrshire cows. (Averages of 416 estimates by owners, based on arbitrary values assumed for a certain fixed age.)*

(Averages are reported to the nearest dollar.)

Age.	Grade Ayrshire cow worth $80 at 3 years of age.			Grade Ayrshire cow worth $100 at 3 years of age.		
	North Central States.	North-eastern States.	United States, all sections.	North Central States.	North-eastern States.	United States, all sections.
Birth	$11	$8	$9	$15	$11	$12
6 months	23	20	20	30	26	26
1 year	37	33	36	48	42	43
2 years	59	55	56	76	72	73
3 years	80	80	80	100	100	100
4 years	87	89	87	109	111	111
5 years	91	96	95	114	120	119
6 years	**95**	**100**	**99**	**116**	**125**	**123**
7 years	94	100	98	114	123	121
8 years	90	96	94	108	118	116
9 years	85	88	89	99	108	106
10 years	78	79	78	90	96	95
11 years	69	71	70	79	84	83
12 years	62	61	61	69	73	73
13 years	54	51	52	60	61	61
14 years	47	43	45	52	50	51
Number of estimates	25	83	137	26	107	141

TABLE IV.—*Influence of age on values of Ayrshire cows. (Averages of 416 estimates by owners, based on arbitrary values assumed for a certain fixed age)*—Continued.

Age.	Purebred Ayrshire cow worth $200 at 3 years of age.			Purebred Ayrshire cow worth $300 at 3 years of age.		
	North Central States.	North-eastern States.	United States, all sections.	North Central States.	North-eastern States.	United States, all sections.
Birth	$44	$42	$44	$67	$65	$66
6 months	73	68	70	99	98	98
1 year	108	101	103	145	138	140
2 years	155	148	150	224	210	212
3 years	200	200	200	300	300	300
4 years	233	228	230	322	335	333
5 years	243	255	253	345	361	357
6 years	**250**	**266**	**262**	**355**	**371**	**367**
7 years	245	265	258	342	360	355
8 years	233	252	244	322	342	335
9 years	209	229	222	290	299	296
10 years	191	202	196	248	252	250
11 years	166	168	165	210	212	210
12 years	142	132	134	172	171	170
13 years	113	99	103	130	130	129
14 years	87	74	78	100	90	90
Number of estimates	23	51	79	10	46	59

GENERAL DISCUSSION OF PRECEDING TABLES.

With few exceptions, the preceding tables indicate that calves and old cows are cheaper in the Northeastern States, and that cows between the ages of 4 and 8 are cheaper in the North Central States. For all breeds, and for all classes of all breeds, the price of cows in health is greatest between 5 and 7 years, with the maximum usually at 6. They are valued about the same at 4 as at 8. The explanation for this may be that though the younger animals have before them a longer period of usefulness, the older ones have already demonstrated their worth. In all the tables the 14-year-old values for pure-bred cows are much greater than for grades. This may be partly due to higher average milk production, but it is undoubtedly more largely due to the possibility that these cows may yet produce valuable calves.

The cow worth $80 at 3 years of age is given a birth value of about $10, while the cow worth $100 at that age is given a birth value of about $12. Similarly the difference in value between the two classes of pure-bred cows at 3 years of age is $100, while the difference in value at birth is in no case above $30, leaving a margin of at least $70 to cover interest on larger investment, risk of a greater possible loss, and any extra expense for feed or care.

TABLE V.—*Influence of age on values of dairy cows, shown in per cent of maximum value. (Averages of 1,844 estimates by owners, based on arbitrary values assumed for a certain fixed age.)*

Age.	Grade cows worth $80 at 3 years of age.				Grade cows worth $100 at 3 years of age.			
	Holstein.	Guernsey	Jersey.	Ayrshire.	Holstein.	Guernsey.	Jersey.	Ayrshire.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Birth	10	11	11	9	9	10	10	10
6 months	24	24	24	20	21	21	21	21
1 year	38	40	38	36	36	35	36	35
2 years	60	62	62	57	59	57	60	59
3 years	78	81	87	81	82	79	83	81
4 years	89	92	94	88	92	92	92	90
5 years	98	**100**	98	96	98	99	98	97
6 years	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**
7 years	97	97	98	99	95	95	98	98
8 years	91	91	94	95	88	87	93	94
9 years	82	83	82	90	78	76	84	86
10 years	74	74	77	79	68	67	74	77
11 years	66	65	66	71	59	56	64	67
12 years	59	56	56	62	51	48	53	59
13 years	51	48	47	52	47	39	43	50
14 years	43	42	39	45	39	32	34	41
Number of estimates	107	101	144	137	159	103	134	141

Age.	Purebred cows worth $200 at 3 years of age.				Purebred cows worth $300 at 3 years of age.			
	Holstein.	Guernsey.	Jersey.	Ayrshire.	Holstein.	Guernsey.	Jersey.	Ayrshire.
	Per cent.	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*	*Per cent.*
Birth	24	22	18	17	26	23	17	18
6 months	34	33	27	27	36	34	25	27
1 year	46	45	41	39	48	48	38	38
2 years	62	63	61	57	66	67	59	58
3 years	78	78	80	76	86	86	85	82
4 years	91	90	91	88	94	95	94	91
5 years	98	98	98	97	99	**100**	99	97
6 years	**100**	**100**	**100**	**100**	**100**	99	**100**	**100**
7 years	96	96	96	98	95	95	94	97
8 years	89	89	90	93	87	88	87	91
9 years	80	79	79	85	76	78	76	81
10 years	69	70	68	75	64	67	63	68
11 years	59	59	55	63	55	57	51	57
12 years	50	49	45	51	45	47	40	46
13 years	41	39	35	39	35	37	30	35
14 years	32	30	26	30	27	28	21	24
Number of estimates	114	70	137	79	148	115	96	59

Table V is a percentage table based on the data given in the preceding tables. It is believed that within reasonable limits the per cent columns will be found useful in estimating the values of other classes of dairy cows. For example, the per cent column for the cow worth $80 at 3 years of age should be approximately accurate for the cow worth $70 at 3 years of age, and the per cent column for the cow worth $100 at 3 years of age should be approximately accurate for the cow worth $110 at 3 years of age. On the other hand, the per cent column for the purebred cow worth $300 at 3 years of age, could not very well be applied to cows valued at twice the amount at that age.

All classes of live stock vary in actual value from time to time, but such variation does not greatly affect the relative value of the animal at different ages. A cow worth $100 at 3 years of age when there is a great demand for dairy cattle will be worth less at the same age when there is smaller demand, but there will be a corresponding fluctuation in value for all other ages. It is, therefore, believed that the tables, especially the percentage table, will be found useful in determining relative value according to age.

Figures 1, 2, 3, and 4 present in graphic form the data for each class of all four breeds as given in Tables I, II, III, and IV. These curves indicate that the difference in value between the various classes of the same breed is greatest when the animals are in their prime and least for calves and old cows. It is also clearly shown that the curvature increases for each succeeding class from the $80 grade to the $300 purebred. This may be explained in part by saying that the price of grade cows is influenced largely by production, that the price of the $200 purebred includes production and registration, and that in determining the price of the $300 purebred three major factors must be considered, production, registration, and advanced registry.

INFLUENCE OF AGE ON VALUE OF WORK HORSES.

TABLE VI.—*Influence of age on values of farm work horses. (Averages of 147 estimates by owners, based on an arbitrary value at prime.)*

Age.	Maximum value, $250.	Per cent of maximum value.	Age.	Maximum value, $250.	Per cent of maximum value.
		Per cent.			*Per cent.*
Birth	$39	16	9 years	227	91
6 months	63	25	10 years	209	84
1 year	96	38	11 years	190	76
2 years	142	57	12 years	174	70
3 years	185	74	13 years	154	62
4 years	220	88	14 years	137	55
5 years	242	97	15 years	119	48
6 years	248	99	16 years	101	40
Maximum	**250**	**100**			
7 years	247	99			
8 years	241	96	Number of estimates	147	.....

Table VI shows the estimated influence of age on the value of farm work horses, and the per cent that the value at any age is of the maximum value. The estimates are for the farm horse worth $250 in his prime. This is a value much above that of the average farm work horse, but the per cent columns may be used within reasonable limits in determining the influence of age on the values of cheaper farm horses. According to these figures the farm work horse reaches his maximum value at some point between six and seven years of age.

If still in health his value at 16 years is 40 per cent of his maximum value. At birth he is worth 16 per cent of his maximum value, and there is little change in value between the ages of 5 and 9.

Figure 5 presents in graphic form the data given in Table VI. This curve differs in some respects from the curves for purebred

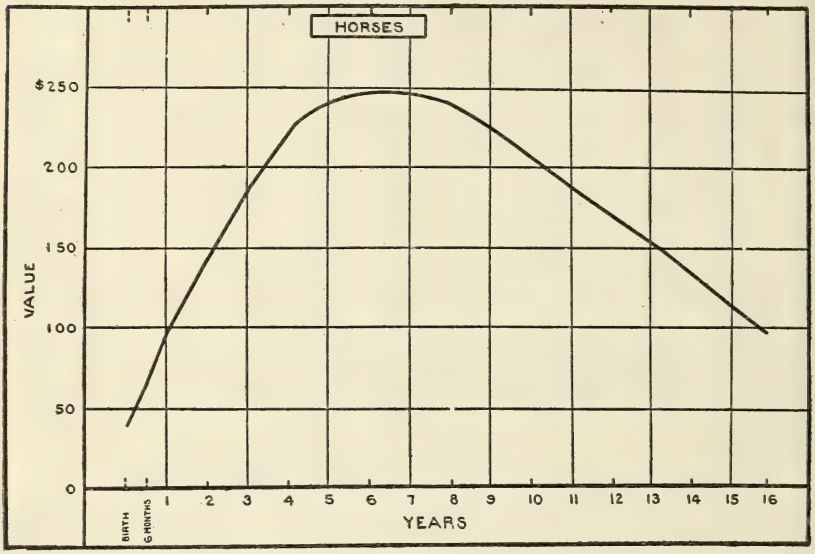

FIG. 5.—Curve showing the influence of age on the values of farm work horses. (Averages of 147 estimates by owners.)

dairy cows and is altogether different from the curves for grade dairy cows. As compared with the values given for pure-bred dairy cows of about the same maximum value, the birth value of horses is considerably less, the age of maturity a little later, and the old-age value somewhat higher.

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